# CSI Roman Syria: archaeology of ancient chemical warfare

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How can we find out what really happened in ancient wars? Especially those for which we happen to have no historical account? Using techniques that are close to those of crime-scene investigators, archaeologists can fill in some of the huge gaps left by other sources. The archaeology of Dura-Europus (below), site of a Persian siege in A.D. 256, offers an intriguing insight into the brutally inventive tactics of the invaders.

### Cold cases

Surviving classical texts give us some astonishingly vivid glimpses into ancient lives, particularly in war. For example, the Syrian-Greek-born Roman soldier-turned-historian Ammianus has left an exciting and gruesome eye-witness account of the siege of the Roman-held city of Amida on the Tigris, by Shapur II, *Shah-an-Shah* (king of kings) of Sasanian Persia (Iran) in A.D. 359, ending with his own escape from the burning city by an unguarded postern gate. Yet the ancient written record is like a piece of torn antique lace: beautiful but full of holes, some large enough to lose entire wars. However, archaeological evidence can fill some of these historical blanks. A dramatic instance of this is the story of another siege, remarkably like that of Amida but occurring a century before, and some 350 km to the south.

While the siege of Amida is known solely through writings, that of the Syrian city of Dura-Europus on the Euphrates is known purely from archaeological remains: no written account survives. Here, in around A.D. 256, this old Macedonian colony turned Roman fortress was besieged by an earlier Sasanian king, Shapur I 'the Great'. The ensuing death-struggle has left the best preserved series of siegeworks in the Roman world, allowing archaeologists to reconstruct the conflict in detail.

Archaeology works in ways very similar to crime-scene forensics. Whether a 'CSI' team confronted with the scene of a recent murder, or archaeologists dealing with an ancient site, investigators look for physical clues to try to work out the sequence of events leading up to deposition of objects and human remains. Indeed, sometimes the two professions come together completely, when archaeologists help investigate modern murders and war-crime cases: recently they have been involved in excavations of mass graves of victims of Saddam in Iraq. The excavations of Dura, begun in the 1920s and continuing today, also produced a mass burial, this time dating to the time of the Sasanian siege. CSI-like study of the position of the bodies and associated evidence has helped unravel the gruesome tale of how twenty Roman soldiers met their deaths.

### Sapping strength

In the third century A.D. Dura was Rome's outpost garrison-city on the Euphrates, in a region increasingly subjected to Sasanian attacks. In 254–5 the garrison began drastic preparations in anticipation of a siege. Dura was protected by cliffs on three sides, but its vulnerable western wall, facing the adjacent plain, was massively strengthened with mudbrick outside and earth rampart inside, entombing adjacent houses, temples, a synagogue, and Christian baptistery.

The Persians arrived, intent on destroying this Roman outpost, probably in the spring of 256. Their assault was massive. Along the western wall, three points of attack have been identified. The great Palmyrene Gate saw ferocious fighting, while a huge siege-ramp of earth and brick was built at the southern corner of the town, in parallel with mining operations designed to destroy an adjacent tower from which men and machines were raining projectiles onto the attackers. It was successfully brought down – but the Romans had not been idle. Not only had they been raising their own walls and rampart to thwart the rising ramp, but they had also tunnelled into it, and as soon as it was ready to bear some massive tower-machine, they fired their mine and collapsed it. Checkmate.

The third site of attack lay north of the Palmyrene Gate. At Tower 19, excavations in the 1930s showed that the Persians tried another tactic, aiming to bring down a section of city wall, so a column of men could charge through the defences. To effect this, they dug a mine under the tower and 11 m of wall on its north side. The logic is clear: towers were the main source of defensive 'fire', so the attackers aimed to destroy that closest to their unshielded right sides as they charged across open ground towards the intended breach. The spectacular remains left in the mines allow us to reconstruct in detail the ensuing struggle in the dark below Tower 19.

Probably starting in a chamber tomb in the necropolis outside the city, the Persians cut an approach tunnel through the soft gypsum, and then, once under the defences, dug upwards through the bed of tough limestone surfacing the plain. Once inside the body of the Roman rampart they removed the lower courses of masonry from the wall, replacing them with timber props and combustibles. However, the mining operations were impossible to conceal on the open plain. The listening defenders located the tunnel, and dug a countermine through their own earth rampart to meet it. To thwart the intended attack they needed to capture the Persian mine gallery.

But the defenders failed. Their countermine was found to contain about twenty skeletons, most in a gruesome tangle compressed into a tiny area barely 2 m by 3 m and, from the arms and coins found amongst the bones, entirely comprised of Romans. Heavily burnt, these still gave off a 'charnel reek' when found. Clearly, the Persians defeated the Romans, inflict-

ing many casualties, then collapsed the Roman mine by burning its pit-props, preventing further interference.

Eventually, the Persians fired their own mine; the props burnt through, and the city's defences crashed downwards. The floors of Tower 19 collapsed, entombing a painted shield and horse armours. But the wall did not topple outwards into the plain as intended. It sank a metre vertically, but stayed upright. The defensive glacis and rampart had worked; no breach resulted. Stalemate.

### A mass murder mystery?

The most remarkable aspect of the Tower 19 deposits was the remains in the countermine where, uniquely for the Roman era, we seem to have a squad of Roman soldiers (and at least one Sasanian) lying more or less where they were killed, still with their equipment, purses full of coins and other items. But can we tell, from the locations, dispositions, and relationships of the bodies exactly how they came to be so cramped together? The original excavator thought the Romans had been worsted in the underground fight for the mines and, as they retreated, their officers had panicked and deliberately collapsed the countermine entrance to prevent the Persians entering the city. The remaining trapped Romans then stood at bay by the sealed entrance while the Persians fired the gallery, and collapsed where they stood from the effects of smoke and flame. This does not seem very plausible. Would the Romans really just have stood there while the Persians prepared to burn them alive? Anyway, loss of the Roman mine did not directly imperil the city, so there was no need to collapse its entrance. The gallery was only about 1.5 m wide; the Persians cannot have emerged more than one at a time, easy targets for the waiting Romans.

In fact, they didn't try. Careful re-examination of surviving drawings of the tangle of Roman bodies shows this was not the result of a huddled group falling where they stood. The bodies had been stacked, and from the Persian side. First, some were placed slumped against the sides, their legs across the tunnel. More were laid on top, across the gallery, then yet more piled on those or laid against the 'Persian' side of the growing heap, at least 1 m tall across the barely head-high tunnel. Here, near the still-open entrance to the Roman gallery, the attackers used the bodies of the fallen defenders to make a wall, hindering any renewed Roman attack long enough for them to bring up the pitch (or bitumen from Iraq's oilfields), sulphur crystals, straw, and brushwood found at this spot by archaeologists, and to start the conflagration which definitively collapsed the Roman mine. The solitary body which lay nearby is identifiable as a Persian (see photo above); I believe that he was the man who started the fire. Perhaps lingering too long to ensure it was properly alight, he was himself overcome by noxious fumes from the accelerants he used.

Such, then, was the gruesome fate of the Roman casualties; they lay not exactly where they had fallen, but where the Persians dumped them. Yet this body stack prompts another question, which implies one final horror. How had the Persians managed to kill twenty Roman soldiers in a space just 10 m long, narrow enough to touch both walls, and barely tall enough to stand upright in? Perhaps it was terrible and sustained hand-to-hand grappling in the dark, where thrusts could not easily be dodged and many fell quickly. But could the Persians have poured men up into their gallery fast enough to inflict such a slaughter? There is another, simpler explanation. The Romans did not die in a fight at all. On breaking into the Persian gallery they were asphyxiated.

The Persians will have heard the Roman counter-miners and probably prepared a deadly surprise for them. As the Romans broke through, the Sasanians withdrew, dropping into their approach tunnel, where they had prepared closed braziers of hot charcoal and stocks of the sulphur and pitch or bitumen which they would soon use to fire the Roman mine. They simply had to throw these materials onto the braziers; the chimney effect between the lower approach mine and the higher Roman gallery, perhaps supplemented by the prevailing westerly wind blowing through the now-connected tunnels, may have meant that they didn't even need bellows to fill the Roman countermine rapidly with thick, choking fumes, deadly sulphur dioxide, carbon monoxide, and heavy hydrocarbons. Roman soldiers at the back pressing forward will have prevented the escape of those nearest the fumes before they were overcome. Those nearest the entrance will have realized the danger as dense clouds engulfed them in utter darkness, and tumbled choking back out of the mine, pursued by billowing smoke. It is little wonder that the Romans hesitated to try to retake their mine, even when the Persians shut off the smoke and started working feverishly to destroy the Roman tunnel.

The clues offered by the Tower 19 body-stack and the items found nearby offer the earliest archaeological evidence for chemical warfare. This is no idle fantasy; we know from historical evidence that such methods were an established part of the repertoire of siege warfare techniques; the Greeks used braziers of burning feathers against the Romans in siege tunnels at Ambracia in 189 B.C. (so Livy tells us in his 38th book).

We do not know how Dura eventually fell, but fall it did, to be sacked, depopulated, and permanently abandoned. Yet its catastrophic fate led to accidental survival of much extraordinary evidence at this 'Pompeii of the East', whose secrets were entombed not by the anger of the gods or natural disaster, but by the hands of men. Now many of these are being revealed, as study of remains found there, artefacts and also papyri, graffiti, and inscriptions, is giving us an extraordinary picture of the life, and fiery death, of an eastern Roman city.

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*Harry Sidebottom's recent novel* Warrior of Rome I: Fire in the East, *about the siege of a Roman city on the Euphrates by Shapur I, is an adaptation of the siege of Dura with some elements drawn from Ammianus' account of Amida.*